

## REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested.

The office action response addresses the following specific subjects.

1. Page 3. Specification.
2. Page 4. Claim rejection. New matter
3. Page 5. Claim rejection. Enablement requirement
4. Page 6. First paragraph. Novelty.
5. Page 6. “Step 1 is confusing ...”
6. Page 6. “Step 3 appears to contradict itself”.
7. Page 7. Anticipated by prior art.

**Response sequence.** For the purpose of clarity and brevity the subject of novelty (point 4) and prior art (point 7) are addressed first, and then responses follow the sequence of the action letter. The numbers in square brackets are the numbers are those used in the published patent application and refer where a subject is addressed in the specifications.

4. **Novelty** Office action, page 6: “Claim 6 rejected under 35 U.S.C. 112,” ...

- 4.1 *Subjective states that do not contain smaller constituents.* [0037-0062].

The invention is the first to focus on subjective states that do not contain smaller constituents [0038, 0040, 0052], their unique properties (please see subsections 4.2 and 4.3 below) and therapeutic potential. These unitary states are exemplified by submodality elements of exteroceptor-based sensations such as the five basic tastes [0052-0054], and are contrasted with percepts, which combine unitary states [0062]. The invention introduces the notion of “elementary mental states” to characterize those simplest subjective states.

- 4.2 *Innateness.* [0064-5, 0068-0071]. The invention is the first to make explicit that those unitary states that are innate.
- 4.3 *Localization.* [0026-7, 0043-4, 0063-0080, 0103-0106]. The invention is the first to make explicit that the subjective quality of elementary mental states is determined by locus-specific neural clusters. By way of example, the subjective quality of sweet taste is determined in submodality-specific area for basic taste in the secondary gustatory cortex.
- 4.4 *The selective inactivation correlation criterion*  
[0026-7, 0097-8, 0101-4, 0109-0110, 0114-5].  
The inactivation of loci that determine the subjective quality of sweet taste leaves unaffected the loci that determine the subjective quality of salty, sour, umami and bitter tastes. This selective inactivation can be manifested by the elimination of the behavioral response to sugar stimuli which leaves unaffected the response to the other four tastants. More generally, the selective inactivation of loci correlated with just one out of several elements in a submodality provides precision not usually available in dealing with non-elementary mental states. For this reason, the resolving power of this correlation criterion is not available elsewhere.
- 4.5 *Utility.* The invention re-defines targets for therapeutic modulation by shifting the causal locus of submodality elements of sensations, such as basic pain, from the body to the brain, and in the brain from pathways to loci [0315]. Targeting identified loci that determine the subjective sensation such as pain has the potential of being more specific than either peripheral nervous system (PNS) related pain drugs (e.g. NSAIDs), or the central nervous system (CNS) pathway-related drugs (e.g. morphine).

7. **Prior art** Office action, page 7: “Claim 6 is rejected under 35 U.S.C. 102 (b) ..”  
The office action cites Trivedi et al (US Patent 4,862,359) as constituting prior art.  
In response I respectfully ask that the following be noted.

7.1 *The subject matter of the two inventions.* Trivedi et al address non-elementary psychological states such as percepts, language and reasoning. These subjects are not directly the subject of the instant patent application [0061-2]. Trivedi et al does not pertain to, and does not mention, “Submodality elements of sensations”, sensory elements that do not contain smaller constituents, or “elementary mental states”.

7.2 *Innateness.* The notion of innateness is central to the present invention. Trivedi et al. does not address innateness. The terms “innate” or “innateness” do not appear in that patent.

7.3 *Localization.* Trivedi et al. uses non-invasive methods. Those have limited spatial and temporal resolution, especially in regards to inactivation (e.g. by transcranial magnetic stimulation). As a consequence, the Trivedi et al patent is confined to gross structures. The term used therein, “regions of interest,” correctly conveys the vastness of the areas involved. Trivedi et al divide the brain into 200 regions. On the average each such region would have about hundred million neurons. The Specifications of the present invention address, and provides methods for identifying loci of neural clusters that are several orders of magnitude below the resolution level of the non-invasive methods employed in Trivedi et al.

*Conclusion.* Section 4 above explains what is novel about the instant patent application. Section 7 details why the subject of the instant patent application is unrelated to the subject of the Trivedi et al patent. Having removed the grounds for these two rejections I respectfully ask that they be withdrawn.

1. *Response to office action, page 3. Specification.*

“The abstract of the disclosure is objected to because the claims are found in ... “

In compliance with the requirement Substitute Specification is enclosed.

Applicant submits that no new matter is contained in the substitute specifications.

Accordingly, I respectfully request that the objection be withdrawn.

2. *Response to office action, page 4. New matter.*

“Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as failing to ...”

Currently Amended Claim 6 is reproduced here with numerical references in square brackets, which are used in the published patent application. They refer to paragraphs in the specifications providing a basis for the claim.

Claim 6 recites: A method for identifying brain loci of neural correlates [0114-5, 0262, 0315] ~~clusters that determine the subjective quality~~ of a particular elementary mental state [0037-0062, 0028-9, 0037-8, 0314], such as any innate submodality element of sensation [0011, 0037-0040, 0051-2, 0059-0062, 0064-5, 0068-0071, 0078, 0081-0093, 0323], comprising the steps of:

(1) establishing correspondence between said submodality element of sensation and the external stimulus that normally elicits it, and then with a voluntary behavioral response, thus establish correspondence between said stimulus and said response, so that said behavioral response following said stimulus signifies the presence of the said element of sensation, and the absence of said behavioral response signifies the absence of said element of sensation [0052-4, 0081-0093, 0213, 0256-0262, 0293];

(2) detecting, immediately following said external stimulus and said corresponding behavioral response, brain loci that manifest transient increased activation [0213, 0257];

(3) identifying, among the said brain loci that ~~manifest~~ manifested increased activation, activation in response to said stimulus, those whose ~~deactivation~~ inactivation selectively eliminates said behavioral response to said external stimulus, without eliminating behavioral responses to external stimuli that induce other elements of sensation within the same submodality [0026-7, 0097-8, 0101-4, 0107-0110, 0114-5, 0263-9].

In view of the identified support provided above for each of the Claim 6, applicant respectfully submits that no new matter is added by Amended Claim 6.

3. *Response to office action, page 5, first and second paragraphs – enablement.*

“Claim 6 is also rejected under 35 U.S.C. 112 first paragraph, as failing ...”

The specification first conceptually identifies brain correlates of elementary mental states and then outlines a method for their actual identification. These methods utilize existing and techniques of psychophysics [0081-0093] and neuroscience [0256-0262] that are generally known to those skilled in the art. For this reason the specifications enable those skilled in the art to carry out the actual identification of brain correlates of elementary mental states.

*Page 5, last paragraph (regarding mice and the complexity of the brain.* The specifications does address applicability of the invention to human subjects. Paragraphs 0213, 0291-0295 refer to the use of non-invasive imaging; paragraphs 0102-4 and 0215 refers to non-invasive inactivation; paragraphs 0296-0301 refer to the identification of brain loci of interest by using brain slices from human brain banks. Relevant is also the reference to non-human primates 0246-0269. Finally, paragraph 0312 refers to the determination of brain loci homology between human and non-human subjects in regards to elementary mental states. One major factor that makes the brain complex is the multitude of extrinsic spatial connections of any contiguous neural cluster. A second factor of complexity is the temporal interactions over said connections. The invention is largely free of both factors of

complexity in taking the local neural function and associated subjective state to be intrinsic local properties [0066-7]. This unique feature makes it possible to determine the capacity of other species to experience certain elementary mental states [0312].

4. See above. It is the first subject addressed.
5. *Response to office action page 6, second paragraph - " Step 1 is confusing ... "*  
The mentioned ambiguity is clarified in the Currently Amended Claim 6.
6. *Response to office action page 6, last paragraph. "Step 3 appears to ..."*  
The mentioned contradiction has removed in the currently Amended Claim 6.
7. *Response to office action page 7, first paragraph – prior art*  
Please see point 7 above.

Fee

This office action response includes a Petition for Extension of Time Under 37 CFR 1.136(a), seeking a 3-month extension, and includes the \$510 fee for the Small Entity Fee, under 37 CFR 1.17(a)(3). No further fees are due.

Respectfully Submitted,

A handwritten signature in black ink that reads "Daniel Alroy". The signature is written in a cursive, flowing style.

Daniel Alroy

Date: October 7, 2005